Chevron

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January 31, 1989

K. O. Mohn
Manager
Hawaiian Refinery
Manufacturing Department

RFI PLAN
HIT 160 010 005

CERTIFIED MAIL NO. P 728 626 914
RETURN RECEIPT REQUESTED

Mr. Jeff Zelikson, Director
Toxics & Waste Management Division, (T-1)
U. S. Environmental Protection Agency
Region IX
215 Fremont Street
San Francisco, CA 94105

Dear Mr. Zelikson:

On October 3, 1988 Chevron received notification from Region IX that EPA had issued a RCRA permit for the Hawaiian Refinery's land treatment unit. The notification indicated that the final permit would become effective thirty days after service of the notification. Part V of the permit requires that the Hawaiian Refinery prepare a RCRA Facility Investigation Plan (RFI). The RFI must address those solid waste management units (SWMU) listed in Attachment V-1 of the permit. The permit further requires that this RFI be submitted to your office for review within 90 days after the effective date of the permit. We are hereby enclosing the subject RFI.

Please note that the RCRA permit as issued, does not contain the "Attachment A" referred to in Part V.A.1. Also, since Chevron originally submitted the list of SWMU's in 1985, we noted that page 4 of the original submission is not included in Attachment V-1. Dr. Lily Herskovits, our permit writer, has since telefaxed a copy of the missing attachment. In the enclosed RFI plan we also address the SWMU's contained on the omitted page of Attachment V-1.

The enclosed RFI plan follows in the same sequence the sites in listed Attachment V-1, however we separate the sites into two sections. The first section of the RFI entitled "Workplan Not Required" lists those sites which are clearly not SWMU's and those SWMU's for which we believe a work plan is not required. The rationale for categorizing these sites as such are individually enumerated. In the first instance, the listed sites are those where **wastes have not been managed**, e.g., process vessels or product storage. In the latter, the waste(s) managed at each respective SWMU has been previously analyzed and the analyses data reviewed by EPA at various times during the ongoing permitting process. These wastes are not hazardous and pose no risk to the environment. The second section of the enclosed plan entitled "Workplan Required" contains those SWMU sites listed in Attachment V-1 and their respective RFI work plans.

EPA has in its files our current groundwater analyses data. Our RCRA permit application supplies basic hydrogeologic data. As part of the RCRA permit conditions, additional hydrogeologic studies are required to fully characterize the groundwater underlying the facility. EPA approved sampling and analysis plans,

and laboratory QA/QC procedures have also been included in the RCRA application and final permit. It is our intention that these plans and procedures be used in the RFI workplan where sampling and analysis occurs. Finally, we have enclosed a recent photograph of each site listed in Attachment V-1 for the reviewer's reference.

Many of EPA's own reports characterize this Chevron refinery as one of low risk with respect to RCRA. The facility is small, compact in design and is clean. Unlike many U.S. Mainland petroleum refineries, our facility does not produce exotic chemicals, chemical manufacturing feed-stocks or lubricating oil. Our slate of products is one of fuels: LP gas, gasolines, jet fuels, middle distillate fuels, residual fuel oils and asphalt. Extensive analyses of our generic wastes have not indicated that they are exotic nor highly toxic. We believe that our waste handling operations over the years has been in accord with generally acceptable practices at the time.

Please contact Mr. Virg Carvalho at (808) 682-5711 if you require additional information.

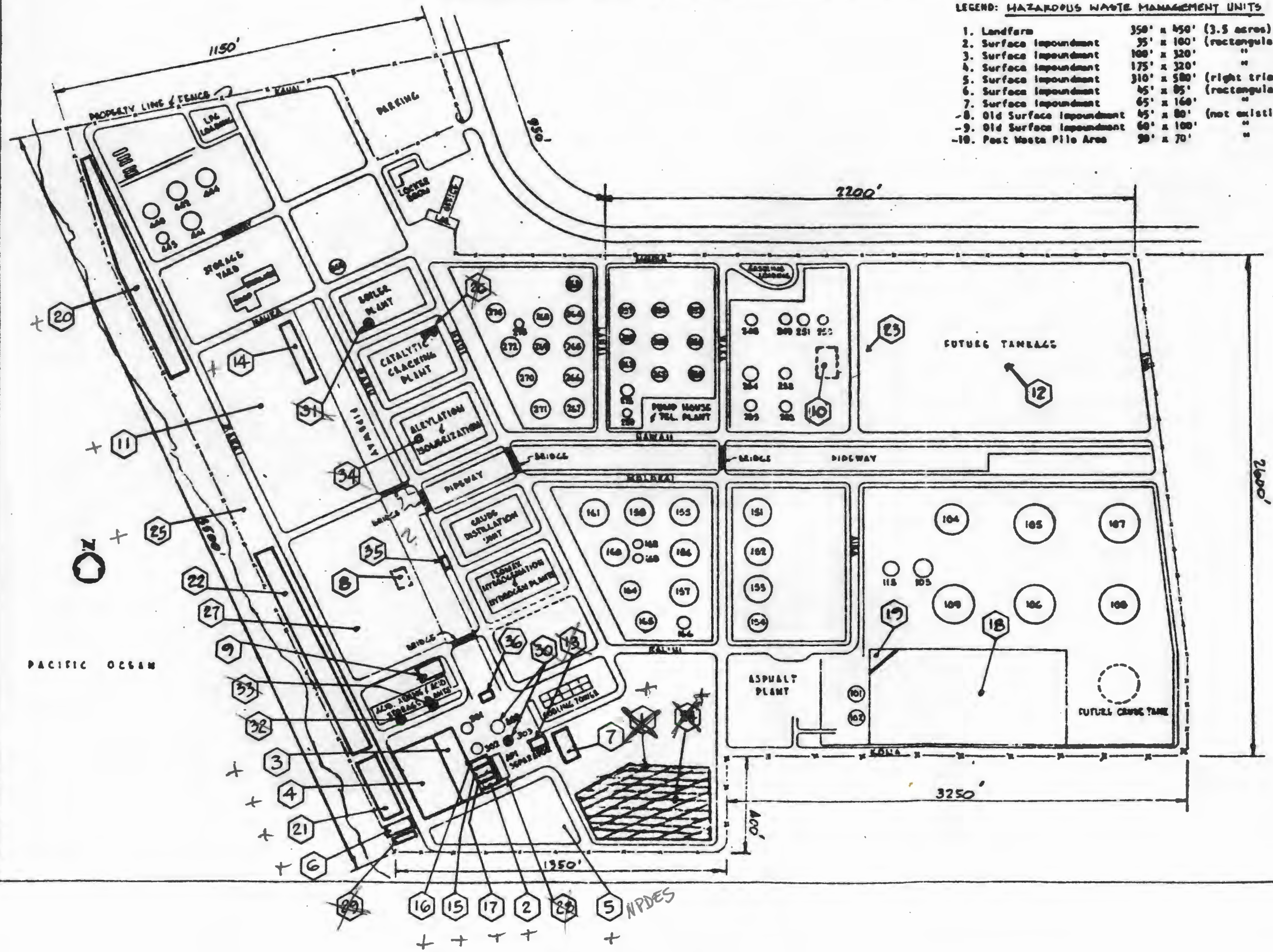
Very truly yours,

K. O. MOHN

VAC:vso
cc: Dr. Lily Herskovits
(T-2-5)
EPA-Region IX

HAWAII REFINERY PLOT PLAN

CONFIDENTIAL



LEGEND: HAZARDOUS WASTE MANAGEMENT UNITS

1. Landfarm	350' x 450'	(3.5 acres)
2. Surface Impoundment	35' x 100'	(rectangular)
3. Surface Impoundment	100' x 320'	"
4. Surface Impoundment	175' x 320'	"
5. Surface Impoundment	310' x 580'	(right triangle)
6. Surface Impoundment	45' x 85'	(rectangular)
7. Surface Impoundment	65' x 160'	"
-8. Old Surface Impoundment	45' x 80'	(not existing)
-9. Old Surface Impoundment	60' x 100'	"
-10. Past Waste Pile Area	50' x 70'	"

LEGEND: Solid Waste Management Units

- -11. Landfill A
- -12. Landfill B
- -13. Flare Lime Basin
- -14. Sewer Sludge Impoundment
- 15. Neutralization Pond
- 16. Settling Basin
- 17. North Surge Pond
- -18. Crude Tank Area Impounding Basin
- -19. Tank Field Storm Water Sump
- -20. LPG Area Cooling Water Pond
- -21. South Ocean Pond
- -22. North Ocean Pond
- -23. Waste Pile A
- -24. Waste Pile B
- -25. Waste Pile C
- -26. FCC Catalyst Fines Hoppers
- -27. Empty Drum Storage Area
- -28. API Separator
- -29. IAF Unit
- -30. Foul/Sour Water Tanks
- -31. Foul Water Oxidizer
- -32. Weak Acid Neutralization Sump
- -33. Strong Acid Neutralization Sump
- -34. Alkylation Plant Neutralization Sump
- -35. Clay Dewatering Basin
- -36. Oil Recovery Box

PLATE 1

HAWAII REFINERY PLOT PLAN

RFI WORKPLAN NOT REQUIRED

1. LANDFILLS

OK

A. LANDFILL A (Site 11):

The site described as Landfill A contained regenerated FCC catalyst fines, spent clay treater clay (jet fuel filter media), and boiler feedwater treatment lime blowdown solids. Chevron currently disposes of these materials in local municipal landfills. These materials have not been found to be RCRA regulated wastes. Regular testing of each of these materials indicate that they are not ignitable (D001), corrosive (D002) or reactive (D003), and that each routinely passes the EP-Toxicity test (D004). Exhibit I.3-2 of Chevron's revised RCRA Part B application tabulates typical analytical data for the FCC catalyst fines and jet filter clay. Typical analytical data for the material in this site can be found tabulated in Chevron's original RCRA Part B permit application in Section I.3 following Attachment I.3-1. The site described as Landfill A no longer exists having been graded in 1984. Since the site contained non-hazardous material, no RFI workplan is required. A recent photograph of the approximate area is enclosed.

OK

B. LANDFILL B (Site 12):

The site described as Landfill B contained landscaping debris, asphalt product spill cleanup materials and a storm damaged building rooftop. None of these materials meet the characteristics of a hazardous waste. Paving asphalt is routinely placed on the ground for roadways. Landscaping debris and damaged building materials pose no hazard. No further action is required on the site or these materials except for normal bio-degradation. A recent photograph of the area is enclosed.

2. SURFACE IMPOUNDMENTS

OK

A. FLARE LIME BASIN (Site 13):

The site described as the Flare Lime Basin contains spent boiler feedwater treatment lime slurry. The impoundment is so named because of it's proximity to the refinery flare stacks. It does not contain flare stack wastes. The Flare Lime Basin material has not been found to be a RCRA regulated waste. Typical analytical data for the material in the Flare Lime Basin can be found tabulated in Chevron's original RCRA Part B permit application in Section I.3 following Attachment I.3-1. Regular testing of this material indicates that it is not ignitable (D001), corrosive (D002) or reactive (D003), and that it routinely passes the EP-Toxicity test (D004). The Flare Lime Basin is currently in operation. The contained material is periodically removed and disposed of at a municipal landfill. Since the site is non-hazardous, no RFI workplan is required. A recent photograph of the impoundment is enclosed.

B. CLAY DEWATERING IMPOUNDMENT (Site 8):

The site described as the Clay Dewatering Impoundment was used to contain water-wet spent jet fuel filter media (clay). Spent jet clay has not been found to be a RCRA regulated waste. Exhibit I.3-2 of Chevron's revised RCRA Part B application tabulates typical analytical data for spent jet filter clay. Regular testing of this material indicates that it is not ignitable (D001), corrosive (D002) or reactive (D003), and that it routinely passes the EP-Toxicity test (D004). The site described as the Clay Dewatering Impoundment no longer exists, the material and some underlying/surrounding soil having been removed and disposed of in a municipal landfill in 1982. The area has since been re-graded. Since the site contained non-hazardous material, no RFI workplan is required. A recent photograph of the approximate area is enclosed.

C. SEWER SLUDGE IMPOUNDMENT (Site 14):

The site described as the Sewer Sludge Impoundment was used to contain material removed from a plugged section of a sub-grade storm water drain line and sump. This section of the storm drain and the sump services the Boiler Plant. The impounded material was generated during the process of mechanical removal of packed lime slurry and lime blowdown from the plugged section of drain line and sump. This material was the same as that which ultimately is placed in the Flare Lime Basin (Site 13) above, and is not RCRA regulated. The site described as the Sewer Sludge Impoundment no longer exists, the material and some underlying/surrounding soil having been removed and disposed of in a municipal landfill in 1984. The area has since been re-graded. Since the site contained non-hazardous material, no RFI workplan is required. A recent photograph of the approximate area is enclosed.

E. NEUTRALIZATION POND (Site 15):
F. SETTLING BASIN (Site 16):

The sites described as the Neutralization Pond and the Settling Basin are part of the refinery's NPDES wastewater treatment facility. Potentially corrosive aqueous streams from the refinery operating units are neutralized to a pH of between 2 and 12.5 prior to being discharged to the Neutralization Pond. Boiler feedwater treatment lime slurry is also discharged to the Neutralization Pond. Lower pH material is mixed with lime slurry in the Neutralization Pond for secondary neutralization to a pH between 6 and 8.

Effluent from the Neutralization Pond flows to the Settling Basin. Additional residence time is provided for in the Settling Basin for the lime solids to settle out. The further clarified wastewater from the Settling Basin then gravity flows onward through the wastewater treatment facility for disposal through the NPDES compliance point.

Material from the bottoms of both impoundments have not been found to be RCRA regulated wastes. Typical analytical data for the material in the bottom of these impoundments can be found tabulated in Chevron's original RCRA Part B permit application in Section I.3 following Attachment I.3-1. Regular testing of this material indicates that it is not ignitable (D001), corrosive (D002) or reactive (D003), and that it routinely passes the EP-Toxicity test (D004). The Neutralization Pond and the Settling Basin are currently in operation. The bottom material from each impoundment is periodically removed and placed in the Flare Lime Basin (Site 13) for

de-watering. Since these sites contained non-hazardous material, no RFI workplan is required. A recent photograph of each impoundment is enclosed.

G. NORTH SURGE POND (Site 17):

The site described as the North Surge Pond is part of the refinery's NPDES wastewater treatment facility. Process area storm water runoff is routed through this impoundment. The North Surge Pond flows by gravity to Oxidation Pond 1 thence through the balance of the NPDES facility. Material from the bottom of this impoundment has not been found to be a RCRA regulated waste. Typical analytical data for the material in the bottom of this impoundment can be found tabulated in Chevron's original RCRA Part B permit application in Section I.3 following Attachment I.3-1. Since the site contains non-hazardous material, no RFI workplan is required. A recent photograph of the impoundment is enclosed.

H. CRUDE TANK AREA IMPOUNDING BASIN (Site 18):

The site described as the Crude Tank Area Impounding Basin (Basin) is part of the original refinery construction. The crude oil tank storage area is surrounded by earthen dikes constructed on its perimeter. These dikes provide for containment in the event of catastrophic tank failure. An integral part of the containment system, the Crude Tank Area Impounding Basin lies within the diked area. The Basin also serves as a storm water impoundment for this confined area in the event of heavy rains. Accumulated storm water is routed to the Tankfield Storm Water Sump (Site 19), thence to the refinery's NPDES wastewater treatment facility. The Basin may be dry or may contain accumulated storm water at varying times.

The Crude Tank Area Basin is currently in service. Accidental crude oil spills and crude oil storage tank bottom spills which occurred prior to 1982 were removed from the Basin. The oil was transferred to the refinery's recovered oil system for reprocessing at that time. Since it is not a RCRA regulated unit, only receives accidental spills from production areas, and is not a waste management unit, the Crude Tank Area Impounding Basin is not subject to HSWA and no RFI workplan is required. A recent photograph of the Basin is enclosed.

I. TANKFIELD STORM WATER SUMP (Site 19):

The site described as the Tankfield Storm Water Sump collects storm water runoff from the gasoline and middle distillate tankfields and the Crude Tank Area Impounding Basin (Site 18). Accumulated storm water is pumped from this sump to the head end of the refinery's NPDES wastewater treatment facility. The sump is constructed entirely of reinforced concrete and is therefore not an impoundment. Since the sump is not a solid waste management unit, no RFI workplan is required. A recent photograph of this sump is enclosed.

J. LPG AREA COOLING WATER POND (Site 20):

The site described as the LPG (Liquified Petroleum Gas) Area Cooling Water Pond contained once-through brackish cooling water. Brackish cooling water, obtained from an adjacent on-site well, is used in the LPG tankage Freon (tm) refrigeration system condensers. When constructed in 1960, this once-through brackish cooling water was

routed through underground piping from the refrigeration condensers to the adjacent shoreline for discharge to the Pacific. Eventual external salt air corrosion of the discharge pipeline caused leakage and ponding of the brackish water on refinery property adjacent to the shoreline. The area was graded in 1982 and this water is now discharged through an NPDES compliance point. Since the site contained non-hazardous material, no RFI workplan is required. A recent photograph of the approximate area is enclosed.

K. SOUTH OCEAN POND (Site 21):
L. NORTH OCEAN POND (Site 22):

The sites described as the South Ocean Pond and North Ocean Pond are part of the refinery's NPDES wastewater treatment facility. These impoundments together provide surge capacity for storm water during periods of heavy rainfall. After return to normal weather conditions, the impounded storm water is routed back through the refinery's NPDES treatment facility at controlled rates. Chevron has disposed of the materials in the bottoms of both these ponds in local municipal landfills. These materials have not been found to be RCRA regulated wastes. Analysis of the material in the bottoms of both these ponds indicate that they are not ignitable (D001), corrosive (D002) or reactive (D003), and that each passes the EP-Toxicity test (D004). Since these sites contain non-hazardous materials, no RFI workplan is required. Recent photographs of these impoundments are enclosed.

3. LANDFARMS

Since Chevron has obtained a RCRA Part B permit to operate it's landfarm, no RFI workplan is required.

4. WASTE PILES

A. WASTE PILE A (Site 23):

Non-hazardous refinery catalysts were placed at the site described as Waste Pile A prior to 1979. There were two distinct piles at this site. Samples of these two materials were collected and analyzed. The tests indicated that this material was not ignitable (D001), corrosive (D002) or reactive (D003), and that it passed the EP-Toxicity test (D004). The material was then removed and disposed of at an off-site landfill in 1984. Since the site contained non-hazardous materials, no RFI workplan is required. A recent photograph of the approximate area is enclosed.

B. WASTE PILE B (Site 24):

Various refinery solid waste material were piled in the area described as Waste Pile B. There are no records to indicate the types and quantities of waste material placed at this site. Discussions with employees indicate that the wastes included catalysts, asphalt cleanup materials, and other miscellaneous rubbish (refractory, scrap iron, etc.). Material was removed from the site and disposed of in a local

landfill in 1979. The refinery's Land Treatment Facility (LTF) now occupies this site. Since the LTF has been RCRA permitted and groundwater around the LTF is monitored , no RFI workplan is required. EPA has inspected the LTF on many occasions and has photographs of the LTF in its files.

C. WASTE PILE C (Site 25):

The site described as Waste Pile C was occasionally used as a final drying area for lime blowdown solids and spent jet filter clay. Prior to 1982, FCC catalyst fines and pond sludges were also placed at this site. Each of these materials are described above as non-hazardous under RCRA regulations. The materials were removed in 1982 and the site was graded. Since the site contained non-hazardous materials, no RFI workplan is required. A recent photograph of the approximate area is enclosed. Waste Water Sludge analysis see in Part B.

5. INCINERATORS

There are no incinerators at the Hawaiian Refinery.

6. STORAGE TANKS (ABOVE GROUND)

A. FCC CATALYST FINES HOPPERS V-5312 & V-5313 (Site 26):

The sites described as FCC (Fluid Catalytic Cracker) Catalyst Fines Hoppers V-5312 & V-5313 are ASME code vessels used to contain regenerated FCC catalyst fines. The vessels are located in the FCC Plant as part of the processing equipment. Catalyst fines are removed from the FCC process by an electrostatic precipitator and are accumulated in vessels V-5312 or V-5313 on an alternating basis. The fines are reintroduced into the FCC process as needed. Any excess amount of fines is disposed of in a municipal landfill. Since V-5312 & V-5313 are not solid waste management units, no RFI workplan is required. A recent photograph of the hoppers is enclosed.

7. STORAGE TANKS (BELOW GROUND)

There are no underground storage tanks at the Hawaiian Refinery.

9. INJECTION WELLS

There are no injection wells at the Hawaiian Refinery.

10. WASTEWATER TREATMENT UNITS

A. API SEPARATOR (Site 28):

The site described as the API Separator is part of the refinery's NPDES wastewater treatment system located in the Effluent Treating Area. Process wastewater and other oily refinery water is routed to the API Separator where primary oil/water gravity separation takes place. Recovered oil is returned to the refining process. Water continues on through the NPDES wastewater treatment system. API Separator sludge is periodically removed and treated in the refinery's RCRA permitted Land Treatment Facility. The API Separator is constructed of entirely of reinforced concrete. Since the API Separator is not a solid waste management unit, no RFI workplan is required. A recent photograph of the separator is enclosed.

B. IAF UNIT (Site 29):

The site described as the IAF (Induced Air Flotation) Unit is part of the refinery's NPDES wastewater treatment system located in the Effluent Treating Area. Treated wastewater is passed through the IAF Unit for algae removal. This is done in order to meet the NPDES permit total suspended solids limitation prior to discharge through the compliance point. After review of the analyses data, EPA determined that the float material removed from this IAF Unit had been improperly classified as a RCRA hazardous waste. The IAF Unit is of welded steel construction. Since the IAF Unit is not a solid waste management unit, no RFI workplan is required. A recent photograph of this unit is enclosed.

C. FOUL/SOUR WATER TANKS 303 & 304 (Site 30):

The site described as Foul/Sour Water Tanks 303 & 304 are part of the NPDES waste water treatment system located in the Effluent Treating Area. The primary purpose for Tanks 303 & 304 is to provide dynamic surge capacity for feed to the refinery's Foul Water Oxidizer. The tanks also serve as pretreatment vessels for solids removal, emulsion settling, oil skimming, and to normalize streams with high concentrations of contaminants. The tanks are sealed and vented to the refinery's flare systems. Tanks 303 & 304 are an integral part of the water treatment process and are not solid waste management units therefore no RFI workplan is required for them. A recent photograph of these tanks is enclosed.

D. FOUL WATER OXIDIZER (Site 31):

The site described as Foul Water Oxidizer is an ASME code vessel located in the Boiler Plant. Foul/sour waters from tanks 303 and 304 are routed through the Foul Water Oxidizer before being discharged to the NPDES wastewater treatment system. The foul/sour is water is heated and contacted with air in this vessel to oxidize potentially reactive compounds to their non-reactive forms. This process vessel is an integral part of the water treatment process and is not a solid waste management unit, therefore no RFI workplan is required for it. A recent photograph of this vessel is enclosed.

E. WEAK ACID NEUTRALIZATION SUMP (Site 32):

The site described as the Weak Acid Neutralization Sump is an acid-resistant brick lined, reinforced concrete sump located in the Acid Plant. Weak sulfuric acid by-product from the Acid Plant manufacturing process is mixed with caustic in this sump and neutralized to a pH of between 2 and 12.5. The neutralized effluent water is then discharged to the Neutralization Pond (Site 15), thence through the refinery's NPDES wastewater treatment system. The sump is not a solid waste management unit, therefore no RFI workplan is required for it. A recent photograph of the sump is enclosed.

F. STRONG ACID NEUTRALIZATION SUMP (Site 33):

As with Site 32 (above), the site described as the Strong Acid Neutralization Sump is an acid-resistant brick lined, reinforced concrete sump located in the Acid Plant sulfuric acid storage area. The sump was constructed for use in the case of an accidental acid spill in the storage area. If a spill occurs on the storage area concrete slab, it and washdown water are mixed with caustic in this sump and neutralized to a pH of between 2 and 12.5. The neutralized effluent water is then pumped to the Neutralization Pond (Site 15), thence through the refinery's NPDES wastewater treatment system. The sump is not a solid waste management unit, therefore no RFI workplan is required for it. A recent photograph of the sump is enclosed.

G. ALKYLATION PLANT NEUTRALIZATION SUMP (Site 34):

As with Sites 32 & 33 (above), the site described as the Alkylation Plant Neutralization Sump is an acid-resistant brick lined, reinforced concrete sump located in the Alkylation Plant. The sump was constructed for use in the case of an accidental acid spill in the Alkylation Plant. If a spill occurs on the Alkylation Plant concrete slab, it and washdown water are mixed with caustic in this sump and neutralized to a pH of between 2 and 12.5. The neutralized effluent water is pumped to the storm water sewer system, thence through the refinery's NPDES wastewater treatment system. The sump is not a solid waste management unit, therefore no RFI workplan is required for it. A recent photograph of the sump is enclosed.

11. TRANSFER STATIONS

There are many areas where transfer activities may occur within the refinery. All refinery process areas are constructed over concrete slabs. Slabs are sloped to drain liquids into a closed oily sewer system. Any incidental spill of routine refinery (RCRA) non-hazardous waste would therefore occur on these slabs where spilled material is contained. Special RCRA hazardous waste handling and transfer procedures are addressed in the RCRA Part B application and permit.

12. WASTE RECYCLING OPERATIONS

There are no waste recycling operations as defined by this regulation in the refinery.

13. WASTE TREATMENT UNITS

A. CLAY DEWATERING BASIN (Site 35):

The site described as the Clay Dewatering Basin is used to contain water-wet spent jet fuel filter media (clay). Spent jet clay has not been found to be a RCRA regulated waste. Exhibit I.3-2 of Chevron's revised RCRA Part B application tabulates typical analytical data for spent jet filter clay. Regular testing of this material indicates that it is not ignitable (D001), corrosive (D002) or reactive (D003), and that it routinely passes the EP-Toxicity test (D004). Upon re-charging the clay filter vessel in the Crude Unit, the water-washed spent clay is allowed to dry in the Clay Dewatering Basin. When the clay is sufficiently dry, it is the hauled to a local municipal landfill for disposal. The Clay Dewatering Basin is sloped, constructed of reinforced concrete and includes a drain to the refinery' oily sewer system. The basin is located in the Crude Unit (plant). Since the site contains non-hazardous material and is not a solid waste management unit, no RFI workplan is required. A recent photograph of the basin is enclosed.

B. OIL RECOVERY BOX (Site 36):

The site described as the Oil Recovery Box is used to recover oil from spills or cleanup of process systems. Mixtures of oil soaked column and vessel debris or oily soil are allowed to settle out in order to recover the product. The recovered oil is transferred to the refinery's recovered oil system for re-processing. Remaining solids are periodically removed and disposed of in the refinery's Land Treatment Facility.

Materials removed from the bottom of the Oil Recovery Box have not been found to be RCRA regulated wastes. Exhibit I.3-2 of Chevron's revised RCRA Part B application (oily sludges) tabulates typical analytical data for the solids contained in the Oil Recovery Box. Additional analytical data for the material in the bottom of this box can also be found tabulated in Chevron's original RCRA Part B permit application in Section I.3 following Attachment I.3-1 (oily sludges). Regular testing of this material indicates that it is not ignitable (D001), corrosive (D002) or reactive (D003), and that it routinely passes the EP-Toxicity test (D004).

The Oil Recovery Box is located in the Effluent Treatment Facility adjacent to the recovered oil tanks. Since the box contains non-hazardous material and is not a solid waste management unit, no RFI workplan is required. A recent photograph of the box is enclosed.

14. WASTE DETOXIFICATION UNITS

There are no waste detoxification units at the Hawaiian Refinery.

RFI WORKPLAN REQUIRED

SURFACE IMPOUNDMENTS

D. AMINE WASH WATER IMPOUNDMENT (Site 9):

Background and Description: The site described as the Amine Wash Water Impoundment was located on the north-westerly side of, and adjacent to the Amine Regenerator Column in Amine Regeneration Plant. This temporary impoundment was constructed of earthen materials directly on the coralline soil. No excavation below existing grade was performed. Employees recall that this impoundment was used on one or two occasions prior to 1980 to drain the regenerator column of wash water and vessel sludge prior to maintenance.

The Amine Regenerator Column is used to heat-strip H_2S from a dilute (15% maximum, aqueous) solution of monoethanol amine (MEA). The circulating MEA solution is used in removal of H_2S from refinery produced gas streams. The circulating MEA solution is pumped to an on-site holding tank prior to taking the column out of service for maintenance. The column is then steamed clean through it's vent connections to the refinery flare system. After the column has been made gas-free, it is water washed. It is this wash water that was impounded in the site in question. No evidence of sludge or waste was observed when the earthen berms and some bottom coralline soil were scraped up and removed to the Land Treatment Unit in 1982. The area was re-graded at that time. A recent photograph of the approximate area is enclosed.

Area Evaluation: While MEA is alkaline, it is not a listed RCRA hazardous waste. Chevron proposes that pH serve as an indicator parameter for the presence of MEA in the impoundment's underlying soils. An EP-Toxicity analysis will also be performed per standards below.

Procedure and Standards: The following procedures and standard shall be used to determine whether the area is clean:

1. SW-846 Methods 9045 (Soil pH) and 1310 (EP-Toxicity) shall be used.

2. Four (4) soil core samples shall be collected from inside the former impoundment area. Two (2) of these samples shall be collected at a depth of 6" below existing grade, two (2) from a depth of 12" below existing grade. In addition, two (2) background soil core samples shall be collected from an area outside and adjacent to the former impoundment are from a depth of 6".

2. If the first depth (6") samples taken from inside the former impoundment area fall between 6.5 and 8.5 pH (EPA Secondary Drinking Water Standard) and the material is not EP-Toxic, no further comparisons shall be made and no further action shall be required.

3. If the first depth (6") core samples taken from inside the impoundment fall outside the range of 6.5 and 8.5 pH, these analyses will be compared to the analysis of background core samples. If the comparison indicates that pH is within 1 standard unit (±1 pH) of the background samples and the material is not EP-Toxic, no further action shall be required.

4. If the first depth core samples fail to meet the criteria in item 2 above, the next depth (12") core analysis shall be used for comparison. If the second depth (12") set of samples indicate that pH is within 1 standard unit (± 1 pH) of background and the material is not EP-Toxic, the site shall be considered clean below that depth and soils above 12" shall be removed to the Land Treatment Facility.

5. Core sampling and analysis shall continue as in Item 3 above at 6-inch depth intervals, two (2) cores per depth, until analysis indicates that pH of the samples is within 1 standard unit (± 1 pH) of background and the material is not EP-Toxic. Material remaining below the last depth shall be considered clean and the soils above shall be removed to the Land Treatment Facility.

WASTE PILES

D. TEL WEATHERING AREA (Site 10):

Background and Description: The site described as the TEL (tetraethyl lead) Weathering Area was used prior to 1980. Gasoline tank bottoms, contaminated with TEL, were spread inside a barricaded area on the soil surface at this site. This was done to facilitate oxidation of TEL to inorganic lead, a practice then recommended by TEL manufacturers.

In 1980 the site was clearly delineated inside the barricade by an elongated iron oxide (rust) stain on the soil. Representative samples obtained from within the area were analyzed and they passed the EP-Toxicity test. The waste material, and soil to a depth of approximately 4", was then mechanically removed and placed in the refinery's Land Treatment Facility. The scarified area was then back filled with clean soil and the area re-graded. A recent photograph of the approximate area is enclosed.

Area Evaluation: While tetraethyl lead is a listed RCRA hazardous waste, it oxidizes to its inorganic form (ethanes and lead metal) quickly upon exposure to air. It is highly improbable that TEL remains at this former site. Previous testing indicated that the area was not RCRA hazardous. However, in order to assess whether there has been lead metal migration in the area, Chevron proposes to test for total lead (Pb) in the underlying soils of the former site.

Procedure and Standards: The following procedures and standards shall be used to determine whether lead is present and if so, it's mobility.

1. SW-846 Methods 7421 (Pb, AA, Furnace) and 1310 (EP-Toxicity) shall be used.

2. Initially, four (4) core samples will be collected from random areas in the approximate site of the waste pile. The samples will be collected at approximately 8-inches below existing grade to ensure that original soil is being collected. Since the original area was elongated, a distance of at least 20-ft shall separate the sample collection points. The samples will be homogenized and split. Method 7421 will be used to analyze for the presence of total lead (Pb) in the first split.

3. If analysis of the first split collected in Item 2 above indicate total lead metal concentrations at or below 500 ppm, the site shall be considered clean and no further action shall be required.

4. If analysis of the first split sample collected in Item 2 above indicate total lead metal concentrations above 500 ppm Method 1310, EP-Toxicity analysis will be performed on the second split to determine mobility. If the second split passes the EP-Toxicity limit for lead, the site shall be considered clean and no further action shall be required.

5. If analysis of the second split of sample collected in Item 2 above fails the EP-Toxicity limit for lead, Chevron will notify EPA in writing that the site requires further delineation. After such notification, Chevron will meet with EPA to discuss appropriate and, (EPA) approvable site delineation plans and procedures. Chevron will then prepare a site delineation plan to determine the possibility of, and extent of any lead migration. This plan will include an assessment of risk to the environment and appropriate cleanup measures, if required. The plan will then be forwarded to EPA for final review and approval.

CONTAINER STORAGE AREAS

A. EMPTY DRUM STORAGE AREA (Site 27):

Background and Description: The site described as the Empty Drum Storage Area (EDSA) is used to accumulate empty lubricating oil and chemical drums until they are shipped off-site. Clean, useable proprietary (Chevron) lubricant drums have been, and are always returned to the Chevron distribution facility for reuse. Clean, useable non-Chevron drums were regularly removed to a Chevron facility for re-use. The current practice however, is to crush and scrap these non-Chevron drums and containers. The occasional spill in this area, which is located on bare soil, is promptly cleaned up. The EDSA is currently in operation.

RCRA regulated material, the containers of which would require triple rinsing upon disposal, are not currently used in the refinery. When RCRA became effective, drums/containers containing acutely hazardous chemicals as defined by the regulation were triple-rinsed within the operating units before being placed at the EDSA. Refinery policy requires that drums and containers destined for this area must be empty (less than 1-inch residue remaining), and that all bungs be in place. There are no records for the years prior to RCRA on the types of chemicals which may have been contained in the empty drums placed at the EDSA. A recent photograph of the area is enclosed.

Area Evaluation: The EDSA does not appear to be a high risk area for contamination due to release of hazardous constituents. Current and post RCRA inventories of lubricants and chemicals do not indicate that these materials are RCRA regulated. The refinery's operation has not changed significantly since start-up in 1960. The workplan for this site will consist of determining whether soil core samples exhibit RCRA hazardous waste characteristics (ignitability, corrosivity, reactivity or EP-Toxicity).

Procedure and Standards: The following procedures and standards shall be used to determine whether soil core samples in the EDSA are hazardous.

1. SW-846 Methods 1010 (Ignitability), 9045 (Soil pH), 9010 & 9030 (Reactivity), and 1310 (EP-Toxicity) shall be used.

2. Two sets of five (5) core samples will be collected from random areas in the approximate site of the EDSA. Four sampling sites shall be chosen that are located about 10-ft inside the approximate perimeter of the EDSA at the four corners of the area. The fifth sampling site shall be chosen at the approximate center of the EDSA. Each sample site will be carefully marked so as to be able to return to that site. Each sample will be suitably marked to identify it's collection site and sample depth. The first five samples (Set A) will be collected at approximately 4-inches below existing grade to ensure that original soil is being collected. A second set of five samples (Set B) will be collected at each location 12-inches below grade.

3. Each Set A sample will be analyzed per Item 1, above. If none of the samples exhibit the characteristics of a RCRA hazardous waste, the EDSA shall be considered clean and no further

action shall be required.

4. If any of the Set A samples exhibit the characteristics of a RCRA hazardous waste, Set B will be analyzed per Item 1, above. If none of the Set B samples exhibit the characteristics of a RCRA hazardous waste, the EDSA shall be considered clean below that depth. Material remaining above that depth will be removed and placed in the refinery's Land Treatment Facility. The scarified are shall be back-filled with clean soil and the area re-graded.

5. If any of the Set B samples exhibit the characteristics of a hazardous waste, Chevron will notify EPA in writing that the site requires further delineation. After such notification, Chevron will meet with EPA to discuss appropriate and, (EPA) approvable site delineation plans and procedures. Chevron will then prepare a site delineation plan to determine the possibility of, and extent of any hazardous constituent migration. This plan will include an assessment of risk to the environment and appropriate cleanup measures, if required. The plan will then be forwarded to EPA for final review and approval.

A. LANDFILL A (SITE 11)
(LOOKING WEST)

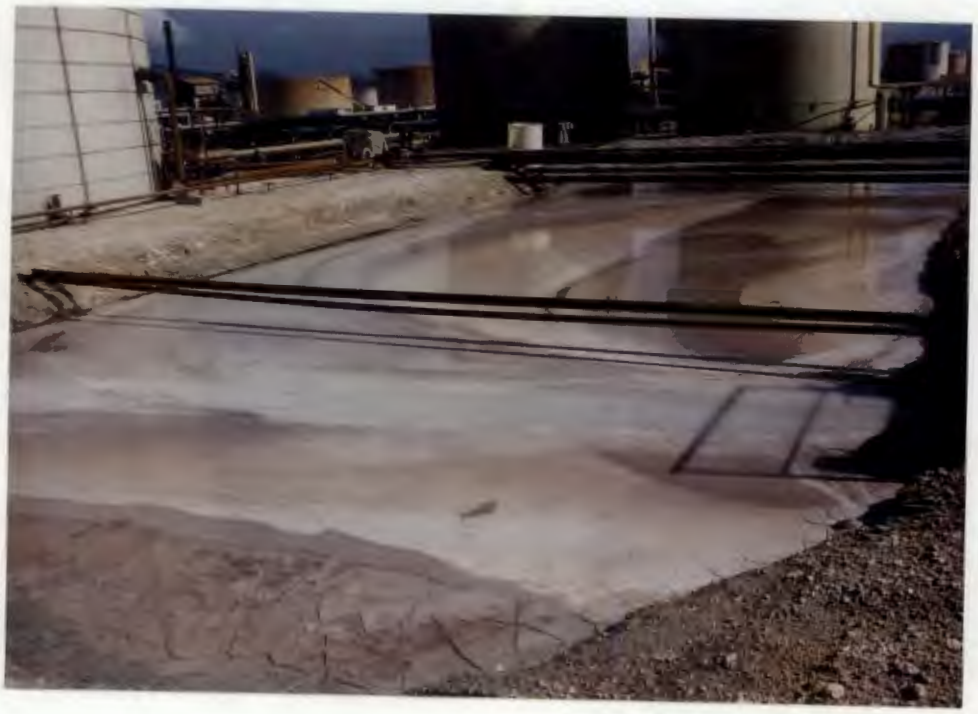
B. LANDFILL B (SITE 12)
(LOOKING NORTH)

A. FLARE LIME BASIN (SITE 13)
(LOOKING SOUTH)

B. CLAY DEWATERING IMPOUNDMENT (SITE 8)
(LOOKING NORTH)

C. SEWER SLUDGE IMPOUNDMENT (SITE 14)
(LOOKING NORTH)

E. NEUTRALIZING BASIN (SITE 15)
(LOOKING WEST)



F. SETTLING BASIN (SITE 16)
(LOOKING EAST)

G. NORTH SURGE POND (SITE 17)
(LOOKING WEST)

H. CRUDE TANK AREA IMPOUNDING BASIN (SITE 18)
(LOOKING SOUTHEAST)

I. TANKFIELD STORM WATER SUMP (SITE 19)
(LOOKING EAST)

J. LPG AREA COOLING WATER POND (SITE 20)
(LOOKING NORTH)

K. SOUTH OCEAN POND (SITE 21)
(LOOKING NORTH)

L. NORTH OCEAN POND (SITE 22)
(LOOKING NORTH)

A. WASTE PILE A (SITE 23)
(LOOKING NORTH)

B. WASTE PILE B (SITE 24)
(LOOKING SOUTHEAST)

C. WASTE PILE C (SITE 25)
(LOOKING NORTH)

A. FCC CATALYST FINES HOPPERS
V-5312 & V-5313 (SITE 26)
(LOOKING SOUTHEAST)

A. API SEPARATOR (SITE 28)
(LOOKING SOUTHWEST)

B. IAF UNIT (SITE 29)
(LOOKING NORTHWEST)

C. FOUL/SOUR WATER TANKS 303 & 304 (SITE 30)
(LOOKING NORTHEAST)

D. FOUL WATER OXIDIZER (SITE 31)
(LOOKING NORTH)

E. WEAK ACID NEUTRALIZATION SUMP (SITE 32)
(LOOKING NORTHEAST)

F. STRONG ACID NEUTRALIZATION SUMP (SITE 33)
(LOOKING SOUTH)

G. ALKYLATION PLANT NEUTRALIZATION SUMP (SITE 34)
(LOOKING NORTHEAST)

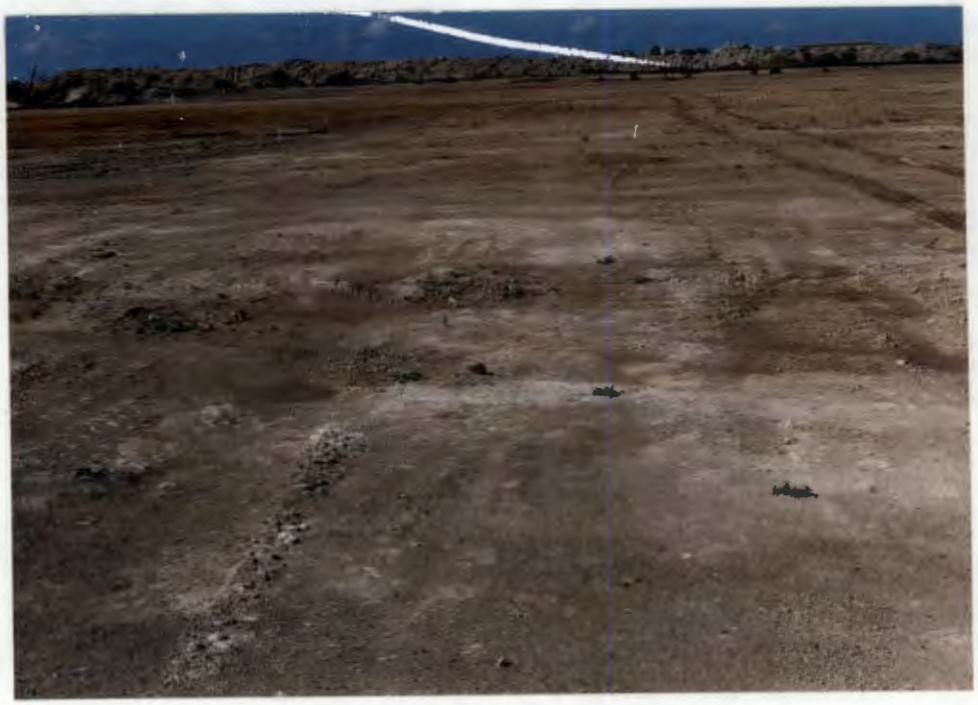
A. CLAY DEWATERING BASIN (SITE 35)
(LOOKING NORTH)

B. OIL RECOVERY BOX (SITE 36)
(LOOKING SOUTH)

D. AMINE WASH WATER IMPOUNDMENT (SITE 9)
(LOOKING EAST)

D. TEL WEATHERING AREA (SITE 10)
(LOOKING NORTH)

A. EMPTY DRUM STORAGE AREA (SITE 27)
(LOOKING NORTH)



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B. LANDFILL B (SITE 12)
(LOOKING NORTH)

A. FLARE LIME BASIN (SITE 13)
(LOOKING SOUTH)

B. CLAY DEWATERING IMPOUNDMENT (SITE 8)
(LOOKING NORTH)

C. SEWER SLUDGE IMPOUNDMENT (SITE 14)
(LOOKING NORTH)

E. NEUTRALIZING BASIN (SITE 15)
(LOOKING WEST)

F. SETTLING BASIN (SITE 16)
(LOOKING EAST)

G. NORTH SURGE POND (SITE 17)
(LOOKING WEST)

H. CRUDE TANK AREA IMPOUNDING BASIN (SITE 18)
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(LOOKING NORTH)